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Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)



Complete if Known		
Application Number	09/945500	
Filing Date	August 30, 2001	
First Named Inventor	Forbes, Leonard	
Group Art Unit	Unknown	£ 1
Examiner Name	Unknown	• •

Attorney Docket No: 01303.029US1 Sheet 1 of 2

			ATENT DOCUMENT	S		
Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
4	US-4412902	11/01/1983	Michikami, Osamu , et al	204	192	06/18/1982
40	US-4780424	10/25/1988	Holler, Mark A	437	29	09/28/1987
42	US-5350738	09/27/1994	Hase, Takashi, et al	505	473	11/27/1992
$\Box P$	US-5691230	11/25/1997	Forbes, L.	437	62	09/04/1996
4	US-5801401	09/01/1998	Forbes, L.	257	77	01/29/1997
LP	US-5852306	12/22/1998	Forbes, Leonard	257	315	01/29/1997
$\mathcal{W}$	US-5981350	11/09/1999	Geusic, J. E., et al	438	386	05/29/1998
12	US-5991225	11/23/1999	Forbes, L., et al	365	230.06	02/27/1998
IP	US-6025627	02/15/2000	Forbes, L., et al	257	321	05/29/1998
LP.	US-6135175	10/24/2000	Gaudreault, P., et al	144	4.1	10/19/1998
UP.	US-6141238	10/31/2000	Forbes, L., et al	365	145	08/30/1999
18	US-6153468	11/28/2000	Forbes, L., et al	438	257	05/17/1999

		<b>FOREIGN PATENT</b>	DOCUMENTS			
Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T <sup>2</sup>

-	OTHE	R DOCUMENTS NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
H		ARYA, S., "Conduction Properties of Thin Al2O3 Films", <u>Thin Solid Films</u> , <u>91</u> , (1982),pp. 363-374	
18		DIPERT, B., "Flash Memory Goes Mainstream", <u>IEEE Spectrum, 30,</u> (October 1993),48-52	
4		ELDRIDGE, J.M., "Growth of Thin PbO Layers on Lead Films", Surface Science, 40, (1973),pp. 512-530	
G		ELDRIDGE, J.,"Measurement of Tunnel Current Density in a Metal-Oxide-Metal System as a Function of Oxide Thickness", <u>Proc. 12th Intern. Conf. on Low Temperature Physics</u> , (1971),pp. 427-428	
LP		GREINER, J.G., "Josephson Tunneling Barriers by rf Sputter Etching in an Oxygen Plasma", <u>Journal of Applied Physics</u> , vol. 42, no. 12, (November 1971),5151-5155	
L		GREINER, J., "Oxidation of lead films by rf sputter etching in an oxygen plasma", Journal of Applied Physics, 45(1), (1974),pp . 32-37	
LP		GRIMBOLT, J.,"I. Interaction of Al Films with O2 at Low Pressures", <u>Journal of</u> the Electrochemical Society, 129(10), (1982),pp. 2366-2368	
4		GRIMBOLT, J.,"II. Oxidation of Al Films", <u>Journal of Electrochem Soc.: Solid-</u> State Science and Technology, (1982),pp. 2369-2372	
LP		GUNDLACH, K., "Logarithmic Conductivity of Al-Al2O3-Al Tunneling Junctions	

DATE CONSIDERED 01/17 **EXAMINER** 



PTO/SB/08A(10-01)
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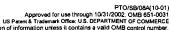
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Attorney Docket No: 01303.029US1

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	OTHER	R DOCUMENTS NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Ť
JA .		Produced by Plasma and by Thermal Oxidation", <u>Surface Science, 27,</u> (1971),pp. 125-141	
LP	·	HODGES, D.A., <u>Analysis and Design of Digital Integrated Circuits, 2nd Edition</u> , McGraw-Hill Publishing. New York,(1988),pp. 354-357	
P		HURYCH, Z.,"Influence of Non-Uniform Thickness of Dielectric Layers on Capacitance and Tunnel Currents", Solid-State Electronics, vol. 9, (1966),967-979	
ЦР		KUBASCHEWSKI, O., Oxidation of Metals and Alloys, Butterworths, London, (1962), pp. 53-63	
LP		LUAN, H., "High Technology Ta2O5 Gate Dielectrics with Tox,eq<10A", IEDM, (1999),pp. 141-144	
20		MASUOKA, FUJIO.,"A 256K flash EEPROM using Triple Polysilicon Technology", 1985 IEEE International Solid-State Circuits Conference. Digest of Technical Papers, (1985),168-169	
IP		MASUOKA, FUJIO.,"A new Flash E2PROM Cell using Triple Polysilicon Technology", International Electron Devices Meeting. Technical Digest, (1984),464-467	
4		MORI, S., "Reliable CVD Inter-Poly Dieletrics for Advanced E&EEPROM", 1985 Synposium on VSLI Technology. Digest of Technical Papers, (1985),pp. 16-17	
4		PASHLEY, RICHARD.D., "Flash Memories: the best of two worlds", <u>IEEE</u> <u>Spectrum</u> , (1989),30-33	
LP		POLLACK, S., "Tunneling Through Gaseous Oxidized Films of Al2O3", <u>Transactions of the Metallurgical Society of AIME, 233, (1965),pp. 497-501</u>	
LP		SHI, Y., "Tunneling Leakage Current in Ultrathin (<4 nm) Nitride/Oxide Stack Dielectrics", IEEE Electron Device Letters, 19(10), (1998),pp. 388-390	
4		SIMMONS, J., "Generalized Formula for the Electric Tunnel Effect between Similiar Electrodes Separated by a Thin Insulating Film", <u>Journal of Applied Physics</u> , 34(6), (1963),pp. 1793-1803	
H		SZE, S., Physics of Semiconductor Devices, Second Edition, John Wiley & Sons, New York,(1981),pp. 553-556	

**EXAMINER** 

DATE CONSIDERED 67



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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as newspan) MAR 2 7 2003 Sheet 1 of 3

Application Number	09/945500	
Filing Date	August 30, 2001	
First Named Inventor	Forbes, Leonard	
Group Art Unit	2818	
Examiner Name	Pham, Ly	

Attorney Docket No: 1303.029US1

		US P	ATENT DOCUMENT	S		
Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
LP	US- 2001/0013621	08/01/2001	Kazuo, Nakazato	257	314	
Ц	US- 2002/0106536	08/08/2002	Lee, Jongho , et al.	428	702	02/02/2001
LP.	US- 2002/0137250	09/26/2002	Nguyen, B. , et al.	438	53	03/15/2002
	US-4,295,150	10/13/1981	Adam, Fritz	357	54	10/01/1979
U.	US-4,757,360	07/12/1988	Faraone, Lorenzo, et al.	257	317	07/06/1983,
y	US-5,042,011	08/20/1991	Casper, Stephen L., et al.	365	205	05/22/1989
12	US-5,071,782	12/10/1991	Mori, Kiyoshi	437	48	06/28/1990
IP.	US-5,073,519	12/01/1991	Rodder, Mark	438	269	
L.R	US-5,280,205	08/18/1994	Green, Robert S., et al.	307	530	04/16/1992
10	US-5,399,516	03/21/1995	Bergendahl, A, et al.	437	43	09/21/1992
13	US-5,418,389	05/23/1995	Watanabe, Y.	257	295	11/09/1993
<del>I</del> R	US-5,497,494	03/05/1996	Combs, J, et al.	395	750	07/23/1993
18	US-5,498,558	03/12/1996	Kapoor, A	437	43	05/06/1994
10	US-5,508,544	04/16/1996	Shah, P. L.	257	316	09/27/1994
	US-5,600,592	02/04/1997	Atsumi, S., et al.	365	185.18	05/08/1995
18	US-5,618,575	04/08/1997	Peter, Gunter	427	8	04/21/1995
7	US-5,619,642	04/08/1997	Nielsen, M, et al.	395	182.04	12/23/1994
LP.	US-5,627,785	05/06/1997	Gilliam, Gary R., et al.	365	189.01	03/15/1996
1	US-5,677,867	10/14/1997	Hazani, E.	365	185	06/30/1995
<u> </u>	US-5,880,991	03/09/1999	Hsu, L, et al.	365	182	04/14/1997
id	US-5,923,056	07/13/1999	Lee, Woo-Hyeong , et al.	257	192	03/12/1998
1 P	US-5,936,274	08/10/1999	Forbes, L., et al.	257	315	07/08/1997
Ll	US-5,986,932	11/16/1999	Ratnakumar, K. N., et al.	365	185.07	06/30/1997
18	US-6,025,228	02/15/2000	Ibok, E., et al.	438	261	11/25/1997
78	US-6,031,263	02/29/2000	Forbes, L., et al.	257	315	07/29/1997
TP	US-6,069,380	05/01/2000	Chou, , et al.	257	315	
70	US-6,069,816	05/30/2000	Nishimura, Kiyoshi	365	145	11/24/1998
70	US-6,124,729	09/26/2000	Noble, W. P., et al.	326	41	02/27/1998
TP-	US-6,134,175	10/17/2000	Forbes, L. , et al.	365	230.06	08/04/1998
LP	US-6,141,248	10/31/2000	Forbes, Leonard, et al.	365	185.08	07/29/1999

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Substitute Disclosure Statement Form (PTO-1449)

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Substitute for form 1449A/PTO INFORMATION DISCLOSURE 09/945500 **Application Number** STATEMENT BY APPLICANT (Use as many sheets as necessal) E August 30, 2001 **Filing Date** Forbes, Leonard **First Named Inventor** 2818 **Group Art Unit** MAR 2 7 2003 Pham, Ly **Examiner Name** Attorney Docket No: 1303.029US1 Sheet 2 of 3

(1)	US-6,143,636	11/07/2000	Forbes, L., et al.	438	587	08/20/1998
LK.				<del> </del>		
1 212	US-6,163,049	12/19/2000	Bui, N. D	257	321	10/13/1998
40	US-6,208,164	03/27/2001	Noble, W. P., et al.	326	41	08/04/1998
18	US-6,229,175	05/08/2001	Uchida, Hidetsugu	257	315	03/19/1999
UP	US-6,238,976	05/29/2001	Noble, W. P., et al.	438	259	02/27/1998
40	US-6,246,606	06/12/2001	Forbes, Leonard , et al.	365	185.03	09/02/1999
LP	US-6,249,020	06/19/2001	Forbes, L., et al.	257	315	08/27/1998
ip	US-6,249,460	06/19/2001	Forbes, L., et al.	365	185.28	02/28/2000
LP	US-6,307,775	10/23/2001	Forbes, L., et al.	365	185.01	08/27/1998
P	US-6,351,411	02/26/2002	Forbes, Leonard, et al.	365	182	06/12/2001
4	US-6,424,001	07/23/2002	Forbes, L., et al.	257	315	02/09/2001

	·	<b>FOREIGN PATENT</b>	DOCUMENTS			
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	OTHER	R DOCUMENTS NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
(0		AFANAS'EV, V, et al., "Electron energy barriers between (100)Si and ultrathin	
U		stacks of SiO2, Al2O3, and ZrO3 and ZrO2 insulators", Applied Physics Letters, 78(20), (2001), pp. 3073-3075	
10		EIERDAL, L., et al., "Interaction of oxygen with Ni(110) studied by scanning	
	L	tunneling microscopy", Surface Science, 312, (1994),pp. 31-53	
( D		ELDRIDGE, J., et al., "Analysis of Ultrathin Oxide Growth on Indium", Thin Solid	
4		<u>Films, 12, (1972), pp. 447-451</u>	
10		GUO, X., "High Quality Ultra-thin (1.5 nm) TiO2/Si3N4 Gate Dielectric for Deep	
		Sub-micron CMOS Technology", IEDM Technical Digest, (1999), pp. 137-140	<u> </u>
1.0		HODGES, D. A., et al., Analysis and Design of Digital Integrated Circuits,	1
UP	1	McGraw-Hill Book Company, 2nd Edition,(1988), pp. 394-396	ļ
		ITOKAWA, H, "Determination of Bandgap and Energy Band Alignment for High-	
	ļ	Dielectric-Constant Gate Insulators Using High-Resolution X-ray Photoelectron	-
1		Spectroscopy", Extended Abstracts of the 1999 International Conference on	
		Solid State Devices and MAterials, (1999), pp. 158-159	
10		KIM, H., "Leakage current and electrical breakdown in metal-organic chemical	
118		vapor deposited TiO2 dielectrics on silicon substrates", Applied Phys. Lett.,	
	1	69(25), (1996), pp. 3860-3862	
10		KUBASCHEWSKI, O., et al., Oxidation of Metals and Alloys, Second Edition,	
14		Butterworths, London,(1962), pp. 1-3, 5,6, 8-12, 24, 36-39	_

**EXAMINER** 

DATE CONSIDERED 75



Substitute for form 1449A/PTO	Complete if Known	( , )
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application Number	09/945500
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Sheet 3 of 3	Attorney Docket No: 1	1303.029US1

OTHER DOCUMENTS NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
0		KUKLI, K., "Development of Dielectric Properties of Niobium Oxide, Tantalum	
4		Oxide, and Aluminum Oxide Based Nanolayered Materials", <u>Journal of the</u>	
		Electrochemical Society, 148(2), (2001), pp. F35-F41	
W		KWO, J., "Properties of high k gate dielectrics Gd2O3 and Y2O3 for Si",	1
		Journal of Applied Physics, 89(7), (2001),pp. 3920-3927	
4		MA, Y., "Zirconium Oxide Based Gate Dielectrics with equivalents Oxide	
		Thickness of LEss Than 1.0 nm and Performance of Submicron MOSFET using	
	,	a Nitride Gate Replacement Process", <u>IEDM - Technical Digest</u> , (1999), pp. 149-	
		152	
LP		MARSHALEK, R., et al., "Photoresponse Characteristics of Thin-Film Nickel-	
		Nickel Oxide-Nickel Tunneling Junctions", <u>IEEE Journal of Quantum Electronics</u> ,	
		<u>QE-19(4),</u> (1983), pp. 749-754	
G.		MULLER, H., "Electrical and Optical Properties of Sputtered In2O3 Films",	
		Physica Status Solidi, 27(2), (1968), pp.723-731	
CD		QI, W, "MOSCAP and MOSFET characteristics using ZrO2 gate dielectric	
9		deposited directly on Si", <u>IEDM - Technical Digest</u> , (1999),pp. 145-148	
P		ROBERTSON, J., "Band offsets of wide-band-gap oxides and implications for	
		future electronic devices", <u>Journal Vac. Sci. Technol. B, 18(3)</u> , (2000), pp. 1785-	
		1791	_
C.		ROBERTSON, J., et al., "Schottky Barrier height of Tantalum oxide, barium	
		strontium titanate, lead titanate, and strontium bismuth tantalate", Applied	
		Physics Letters, vol. 74, no. 8, (02/22/1999), pp. 1168-1170	
U		SWALIN, R., "Equilibrium between Phases of Variable Composition",	
		Thermodynamics of Solids, 2nd Edition, (1972), pp. 165-180	
LP		YAN, J., et al., "Structural and electrical characterization of TiO2 grown from	
		titanium tetrakis-isopropoxide (TTIP) and TTIP/H2O ambients", <u>Journal Vac. Sci.</u>	
		<u>Technol. B, 14(3),</u> (1996), pp. 1706-1711	<u> </u>

EXAMINER/

DATE CONSIDERED 05/23/2003